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Conference Abstract

Plant-pollinator Interaction Data: A case study of the WorldFAIR project

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Abstract

Biodiversity is a data-intensive science and relies on data from a large number of disciplines in order to build up a coherent picture of the extent and trajectory of life on earth (Bowker 2000). The ability to integrate such data from different disciplines, geographic regions and scales is crucial for making better decisions towards sustainable development. As the Biodiversity Information Standards (TDWG) community tackles standards development and adoption beyond its initial emphases on taxonomy and species distributions, expanding its impact and engaging a wider audience becomes increasingly important.

Biological interactions data (e.g., predator-prey, host-parasite, plant-pollinator) have been a topic of interest within TDWG for many years and a Biological Interaction Data Interest Group (IG) was established in 2016 to address that issue. The IG has been working on the

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complexity of representing interactions data and surveying how Darwin Core (DwC, Wieczorek 2012) is being used to represent them (Salim 2022).

The importance of cross-disciplinary science and data inspired the recently funded WorldFAIR project—Global cooperation on FAIR data policy and practice—coordinated by the Committee on Data of the International Science Council (CODATA), with the Research Data Alliance (RDA) as a major partner. WorldFAIR will work with a set of case studies to advance implementation of the FAIR data principles (Fig. 1). The FAIR data principles promote good practices in data management, by making data and metadata Findable, Accessible, Interoperable, and Reusable (Wilkinson 2016). Interoperability will be a particular focus to facilitate cross-disciplinary research. A set of recommendations and a framework for FAIR assessment in a set of disciplines will be developed (Molloy 2022).

Figure 1.

Petal diagram showing the case studies encompassed in the WorldFAIR project. Source: https://codata.org/initiatives/decadal-programme2/worldfair/. License: CC BY 4.0.

One of WorldFAIR's case studies is related to plant-pollinator interactions data. Its starting point is the model and schema proposed by Salim (2022) based on the DwC standard, which adheres to the diversifying GBIF data model strategy and on the Plant-Pollinator

vocabulary described by Salim (2021). The case study on plant-pollinator interactions originated in the TDWG Biological Interaction Data Interest Group (IG) and within the RDA Improving Global Agricultural Data (IGAD) Community of Practice. IGAD is a forum for sharing experiences and providing visibility to research and work in food and agricultural data and has become a space for networking and blending ideas related to data management and interoperability.

This topic was chosen because interoperability of plant-pollinator data is needed for better monitoring of pollination services, understanding the impacts of cultivated plants on wild pollinators and quantifying the contribution of wild pollinators to cultivated crops, understanding the impact of domesticated bees on wild ecosystems, and understanding the behaviour of these organisms and how this influences their effectiveness as pollinators. In addition to the ecological importance of these data, pollination is economically important for food production. In Brazil, the economic value of the pollination service was estimated at US$ 12 billion in 2018 (Wolowski 2019).

All eleven case studies within the WorldFAIR project are working on FAIR Implementation Profiles (FIPs), which capture comprehensive sets of FAIR principle implementation choices made by communities of practice and which can accelerate convergence and facilitate cross-collaboration between disciplines (Schultes 2020). The FIPs are published through the FIP Wizard, which allows the creation of FAIR Enabling Resources. The FIPs creation will be repeated by the end of the project and capture results obtained from each case study in order to advance data interoperability. In the first FIP, resources from the Global Biodiversity Information Facility (GBIF) and Global Biotic Interactions (GloBI) were catalogued by the Plant-Pollinator Case Study team, and we expect to expand the existing FAIR Enabling Resources by the end of the project and contribute to plant-pollinator data interoperability and reuse.

To tackle the challenge of promoting FAIR data for plant-pollinator interactions within the broad scope of the several disciplines and subdisciplines that generate and use them, we will conduct a survey of existing initiatives handling plant-pollinator interactions data and summarise the current status of best practices in the community. Once the survey is concluded, we will choose at least five agriculture-specific plant-pollination initiatives from our partners, to serve as targets for standards adoption. For data to be interoperable and reusable, it is essential that standards and best practices are community-developed to ensure adoption by the tool builders and data scientists across the globe. TDWG plays an important role in this scenario and we expect to engage the IG and other interested parties in that discussion.

Keywords

biotic interaction, pollination, FAIR, agriculture

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